

What is claimed is:

1. A method for forming an aluminide coating on a target surface of a metal substrate bounding a contained space of the substrate comprising:

a) positioning a coating tape over said contained space to at least partially enclose said contained space, wherein the coating tape is in out-of-contact relation with the target surface and comprises:

(1) a mixture comprising:

(i) at least one aluminum source comprising from about 70% to about 99% by weight of the mixture, the aluminum source containing from about 20 wt.% to about 60 wt.% aluminum; and

(ii) at least one halide activator comprising from about 1% to about 15% by weight of the mixture; and

(2) at least one binder;

b) heating the target surface to a temperature effective to cause the aluminum source to react with the activator and the target surface, and thereby form an aluminide coating on the target surface.

2. The method of claim 1, wherein the aluminum source is a Cr—Al alloy containing from about 20 wt.% to about 60 wt.% Al in the alloy.

3. The method of claim 1, wherein the halide activator is LiF.

4. The method of claim 2, wherein the halide activator is LiF.

5. The method of claim 1, further comprising the step of before positioning the coating tape, disposing a masking material onto an area of the metal substrate, said area being laterally adjacent to the contained space and not within the

contained space, whereby the masking material inhibits the coating material from forming an aluminide coating on the laterally-adjacent area.

6. A method for forming an aluminide coating on a target surface of a metal substrate, said target surface bounding a contained space formed by said metal substrate, the method comprising:

a) positioning a tape over said contained space to at least partially enclose said contained space but in out-of-contact relation with the target surface, wherein the tape is in out-of-contact relation with the target surface;

b) disposing a slurry coating composition on the tape, the slurry coating composition comprising:

(1) a solid pigment mixture, in the amount of from about 30% by weight to about 80% by weight of the slurry coating composition, said solid pigment mixture comprising:

(i) Cr-Al alloy containing from about 20 wt.% Al to about 60 wt.% Al of said alloy; and

(ii) LiF in an amount from about 0.3 wt.% to about 15 wt.% of said Cr-Al alloy;

(2) at least one organic binder; and

(3) a solvent;

the tape being adapted to substantially decompose without residue upon heating to a decomposition temperature which is below a temperature effective to cause the alloy to react with the halide activator and the target surface; and

c) heating the target surface to a temperature effective to cause the alloy to react with the activator and the target surface and thereby form an aluminide coating on the target surface.

7. The method of claim 6, further comprising the step of before positioning the tape, disposing a masking material onto an area of the metal substrate,

said area being laterally adjacent to the contained space and not within the contained space, whereby the masking material inhibits the slurry coating composition from forming an aluminide coating on the laterally-adjacent area.

8. An article comprising:

(a) a metal substrate having a target surface bounding a contained space formed by the substrate;

(b) a coating tape disposed over said contained space to at least partially enclose said contained space, wherein the coating tape is in out-of-contact relation with the target surface and comprises:

(1) a mixture comprising:

(i) at least one aluminum source comprising from about 70% to about 99% by weight of the mixture, the aluminum source containing from about 20 wt.% to about 60% wt.% aluminum; and

(ii) at least one halide activator comprising from about 1% to about 15% by weight of the mixture;

(2) at least one binder;

whereby upon heating the metal substrate to a temperature effective to cause the aluminum source to react with the halide activator and the target surface, an aluminide coating is formed on the target surface of the contained space.

9. The article of claim 8, wherein the aluminum source is a Cr—Al alloy and the halide activator is LiF.